Translation

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PCT/EP2003/006084

PATENT COOPERATION TREATY

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INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference P 2818/PCT W/HE	**FOR FURTHER ACTION**	See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)
International application No. PCT/EP2003/006084	International filing date (*day/month/year*) 10 June 2003 (10.06.2003)	Priority date (*day/month/year*) 10 June 2002 (10.06.2002)
International Patent Classification (IPC) or national classification and IPC A61C 1/00, A61B 18/20, 18/22		
Applicant SCHÄFER, Olaf		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 5 sheets, including this cover sheet.

☒ This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of 2 sheets.

3. This report contains indications relating to the following items:

- I ☒ Basis of the report
- II ☐ Priority
- III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☐ Certain defects in the international application
- VIII ☐ Certain observations on the international application

Date of submission of the demand 12 January 2004 (12.01.2004)	Date of completion of this report 07 June 2004 (07.06.2004)
Name and mailing address of the IPEA/EP Facsimile No.	Authorized officer Telephone No.

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.
PCT/EP2003/006084

I. Basis of the report

1. With regard to the **elements** of the international application:*

☐ the international application as originally filed

☒ the description:

pages 1, 3-7, as originally filed
pages _____, filed with the demand
pages 2, 2a, filed with the letter of 29 April 2004 (29.04.2004)

☒ the claims:

pages 1-17, as originally filed
pages _____, as amended (together with any statement under Article 19
pages _____, filed with the demand
pages _____, filed with the letter of _____

☒ the drawings:

pages 1/2-2/2, as originally filed
pages _____, filed with the demand
pages _____, filed with the letter of _____

☐ the sequence listing part of the description:

pages _____, as originally filed
pages _____, filed with the demand
pages _____, filed with the letter of _____

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.
These elements were available or furnished to this Authority in the following language _____ which is:

☐ the language of a translation furnished for the purposes of international search (under Rule 23.1(b)).

☐ the language of publication of the international application (under Rule 48.3(b)).

☐ the language of the translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

☐ contained in the international application in written form.

☐ filed together with the international application in computer readable form.

☐ furnished subsequently to this Authority in written form.

☐ furnished subsequently to this Authority in computer readable form.

☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. ☐ The amendments have resulted in the cancellation of:

☐ the description, pages _____

☐ the claims, Nos. _____

☐ the drawings, sheets/fig _____

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).**

* *Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rule 70.16 and 70.17).*

** *Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.*

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims	1-17	YES
	Claims		NO
Inventive step (IS)	Claims		YES
	Claims	1-17	NO
Industrial applicability (IA)	Claims	1-17	YES
	Claims		NO

2. Citations and explanations

Reference is made to the following documents:

D1: US-B1-6 270 342 (NEUBERGER ET AL.)
7 August 2001

D2: DE 198 44 719 A (NIDEK)
1 April 1999

D3: EP-A-0 780 097 (BUERMOOS DENTALWERK)
25 June 1997

D4: US-A-5 346 489 (LEVY ET AL)
13 September 1994.

1. Document US 6270342 discloses a medical tool system for applications in dental treatment using a laser, the light guide of said laser being carried in a handpiece and comprising a laser module with power electronics (column 7, lines 49-56; column 10, lines 24-26).

The subject matter of independent claim 1 differs therefrom in that assigned to the first laser module is a second laser module, with a different wavelength.

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The problem addressed by the present invention can be regarded as that of making it possible to carry out different medical treatments using a single tool. The solution is found in the use of two laser modules, each having a different wavelength.

Document DE 19844719 discloses a laser treatment device that can be switched between a plurality of wavelengths, depending on the object to be treated in each case. In addition, according to said document, different treatments can be carried out using a single tool.

Therefore, the feature relating to the second laser module concerns merely an alternative, equivalent solution which a person skilled in the art would substitute according to the circumstances in order to solve the problem of interest, without thereby being inventive.

In consequence, the subject matter of independent claim 1 cannot be considered inventive (PCT Article 33(3)).

2. For the following reasons, the additional technical features of claims 2-17 cannot be considered inventive (PCT Article 33(3)):

The additional technical features of claims 2-3, 7-9, 12-13 and 15-17 are also known from D1 (see figure 8; column 5, lines 27-29 and lines 44-47; column 6, lines 35-42; column 7, lines 60-63).

/...

Document D2 (figure 2) discloses the additional technical features of claims 6, 11 and 15.

The additional technical features of claims 4-5 and claim 14 are known from document D3 (column 2, lines 46-53, column 7, lines 9-14); document D4 (column 3, lines 12-15) discloses the additional technical features of claim 10.

3. In pursuing the application, the applicant should be aware of the following points:

For the assessment of inventive step, the applicant is invited to state, in responding to the report, what problem is solved by the characterising features of the new claim 1 relative to the closest prior art (PCT Rule 5.1(a)(iii)).

When submitting amended claims, the applicant should bring the description into line with the amended claims (PCT Rule 5.1(a)(iii)).

When revising the application, care should be taken to ensure that the subject matter thereof does not go beyond the disclosure of the application as filed (PCT Article 19(2)).

In order to facilitate examination of the amended application in the light of PCT Article 19(2), the applicant is requested to indicate clearly the amendments made, regardless of whether the amendments in question are insertions, substitutions or deletions, and to indicate those parts of the original application which support said amendments.

The applicant is advised that, pursuant to PCT Rule 66.8(a), the PCT examiner may not make any amendment, however slight.

Medical tools for dental treatments by means of a laser

The present invention relates to a medical tool for dental treatments by means of a laser, whose light guide runs in a handpiece, said light guide being assigned a laser module with power circuitry.

In the field of dentistry, there are presently five different laser types with a total of seven different wavelengths. For example, a dental laser with a handpiece is disclosed in WO 93/19684. With such a laser, however, only a single method of treatment is possible. The same applies also to a medical tool corresponding to EP 0 523 506 A1, in which channels for a coolant are also provided in the handpiece.

DE 198 44 719 A1 discloses a laser treatment device, in particular for performing medical or surgical treatment by means of laser radiation. This device comprises a solid-state laser for generating a laser beam, an excitation light source which excites the solid-state laser, a first optical system with a Q-switch which transmits light waves generated by the solid-state laser as a pulsed laser beam, a second optical system with which light waves generated by the solid-state laser are transmitted as a continuous wave laser, and a system for switching the optical path, with which system an optical path for the light oscillations generated by the

solid-state laser is switched from one of the optical paths of the first optical system or of the second optical system.

In US 6,270,342 B1, a handpiece specially designed for dental treatments is proposed. The handpiece contains a functional device which, for example, can be a diode laser, a diode-pumped solid-state laser, an LED, a microwave generator or ultrasound generator. In an illustrative embodiment 6, it is then stated that light from the laser device can be divided into two light systems. The first laser system is used for the surgical intervention, and the second laser system disinfects the tissue in order to reduce side effects or blood loss.

The object of the present invention is to develop a medical device of the above-mentioned type which allows the dentist to use one and the same device to carry out different treatments in dentistry.

This object is achieved by the fact that the first laser module is assigned a second laser module with a different wavelength.

Especially when a short-wavelength laser is chosen for the first laser module and a long-wavelength laser is chosen for the second laser module, about 90 to 95% of all desired treatments can be performed with one and the same tool. This affords clear advantages for the dentist, encouraging him to invest in a tool of this kind.

In a preferred illustrative embodiment, the first module should be one for a diode laser, a wavelength of 750 to 1100 nm being preferred. More restrictively, the wavelength preferably lies at 810 ± 10 nm or 980 ± 10 nm. The power is typically from 1 to 20 W.

The second, long-wavelength laser is preferably an erbium:YAG laser in a wavelength range of 2500 to 3500 nm. Here, a wavelength of 2940 ± 100 nm is preferred.

It is conceivable to assign the same light guide to both laser modules. However, the illustrative embodiment is preferred in which each laser module has its own light guide, it being possible to provide both light guides together in one handpiece or else separately in separate handpieces. For the diode laser, glass fiber is preferred as the light guide, and a hollow waveguide is preferred for the erbium:YAG laser.

The diode laser should preferably also be assigned an optical element composed of two lenses. Moreover, a line for a coolant is also provided in the handpiece.

As has been mentioned above, the different lines can be provided in a single handpiece, but it is also conceivable for the dentist to have several handpieces available with different combinations of light guide and/or coolant line. The latter has the advantage that the dentist cannot inadvertently start up incorrect operations since he always has to select the desired handpiece and he does not